

Preface

FR100L&FR200L special purpose inverter is designed for wire drawing machine, based on the core control arithmetic of FR100 or FR200 vector control inverter, combined with the control requirements of wire drawing machine application. It can be widely used in water tank type wire drawing host, water tank type winding machine, straight drawing machine and etc. Starting at any position of lower-limit, point zero or upper limit on tension rod, tracking the speed automatically to keep balance bar at the middle position, whenever without load, half load, full load, and whatever thick line, thin line, low speed, high speed, the tension is constant.

When debugging the product, please refer to the commissioning guide in this manual, maintenance can refer to FR100 or FR200 user manual.

IMPORTANT NOTES

- ◆ To illustrate the details of the products, pictures in this manual based on products with outer casing or safety cover being removed. When using this product, please be sure to well install outer casing or covering by the rules, and operating in accordance with the manual contents.
- ◆ The illustrations this manual for illustration only and may vary with different products you have ordered.
- ◆ The company is committed to continuous improvement of products, product features will continue to upgrade, the information provided is subject to change without notice.
- ◆ If you are using have questions, please contact our regional agents or our customer service center. Customer Service Tel 0755 -33067999.
- ◆ The company's other products please visit our website. <http://www.freon.com.cn>

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Chapter 1 Product Information

1.1 Nameplate information

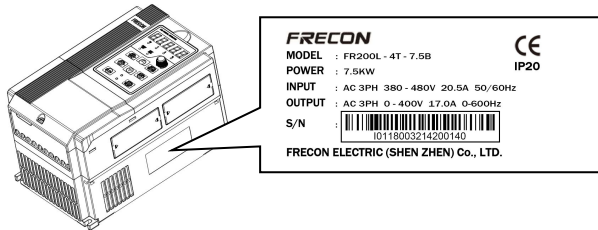


Fig. 1-1 Nameplate

Model Instruction

Model numbers on name plate consist of numbers, symbols, and letters, to express its respective series, suitable power type, power level and other information.

FR200L-4T-7.5B

FR200L: Drive for wire drawing machine

Input voltage:
2S:AC Single phase 220V
4T:AC Three phase 380V

Braking unit:
B: Built-in braking unit

Adaptable Motor(Kw):
7.5: 7.5KW

Fig 1-2 Model Explanation

1.2 FR100&FR200L Special Purpose Drive Model Selection

Model No.	Power capacity KVA	Rated Input current A	Rated output current A	Applicable motor kW HP	
3-Phase: 380V, 50/60Hz	Range: -15%~+30%				
FR100L-4T-0.7B	1.5	3.4	2.5	0.75	1
FR100L-4T-1.5B	3	5.0	4.2	1.5	2
FR100L-4T-2.2B	4	5.8	5.5	2.2	3
FR100L-4T-4.0B	6	11	9.5	3.7、4	5
FR200L-4T-4.0B					
FR200L-4T-5.5B	8.9	14.6	13	5.5	7.5
FR200L-4T-7.5B	11	20.5	17	7.5	10
FR200L-4T-011B	17	26	25	11	15
FR200L-4T-015B	21	35	32	15	20
FR200L-4T-018B	24	38.5	37	18.5	25
FR200L-4T-022B	30	46.5	45	22	30
FR200L-4T-030B	40	62	60	30	40
FR200L-4T-037	57	76	75	37	50
FR200L-4T-045	69	92	91	45	60
FR200L-4T-055	85	113	112	55	70
FR200L-4T-075	114	157	150	75	100
FR200L-4T-090	134	160*	176	90	125
FR200L-4T-110	160	190*	210	110	150
FR200L-4T-132	192	232*	253	132	175

* FR200-4T-90G/110P or above is provided with an external-mounted DC reactor in shipment as default

1.3 Dimensions, Installation dimension and Weight

a:FR100L 0.75~4.0kW dimensions and wall mounting dimensions

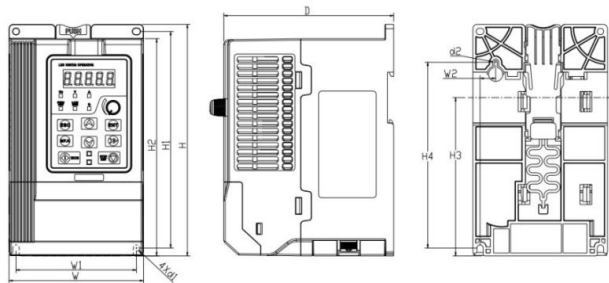


Fig 1-3 Wall mounting installation diagram

Table 1-2 Configuration, mounting dimensions and weight

Model No.	Dimensions and installation size (mm)											Weight (Kg)
	W	H	D	W1	W2	H1	H2	H3	H4	D1	D2	
FR100L-4T-0.7B	110	173	135	100	11	163	163	121.8	140.5	4.5	5	1.5
FR100L-4T-1.5B												
FR100L-4T-2.2B												
FR100L-4T-4.0B												

b: FR200L 0.75~15kW dimensions and wall mounting dimensions

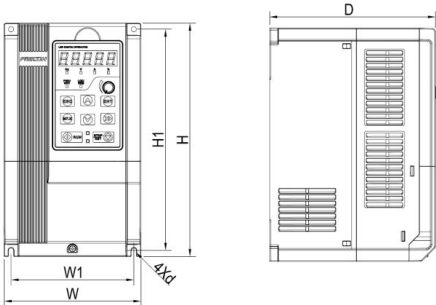


Fig 1-4 0.75~15Kw Wall mounting installation diagram

c: FR200L 18.5~132kW dimensions and wall mounting dimensions

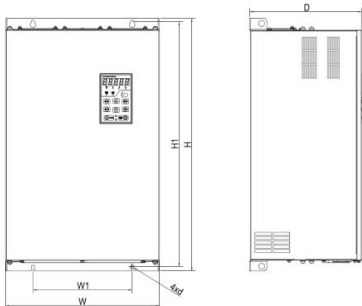


Fig 1-5 0.75~15Kw Wall mounting installation diagram

Table 1-3 Configuration, mounting dimensions and weight

Model No.	Dimensions and installation size (mm)						Weight (Kg)
	W	W1	H	H1	D	Installation Aperture	
FR200L-4T-4.0B	146	131	249	236	177	5.5	3.2
FR200L-4T-5.5B							
FR200L-4T-7.5B							
FR200L-4T-011B	198	183	300	287	185	5.5	5.4
FR200L-4T-015B							
FR200L-4T-018B							
FR200L-4T-022B	255	176	459	443	220	7	15.5
FR200L-4T-030B							
FR200L-4T-037							
FR200L-4T-045	270	130	590	572	260	7	27.5
FR200L-4T-055							
FR200L-4T-075							
FR200L-4T-090	357	230	590	572	260	7	37
FR200L-4T-110							
FR200L-4T-132							
	430	320	829.5	802	293	12	77.7

Chapter 2 Commissioning guide

2.1 Wire & cable winding and unwinding of wire drawing machine diagram

It is consisted of host, stretch film, tension rod, winder and winding machines

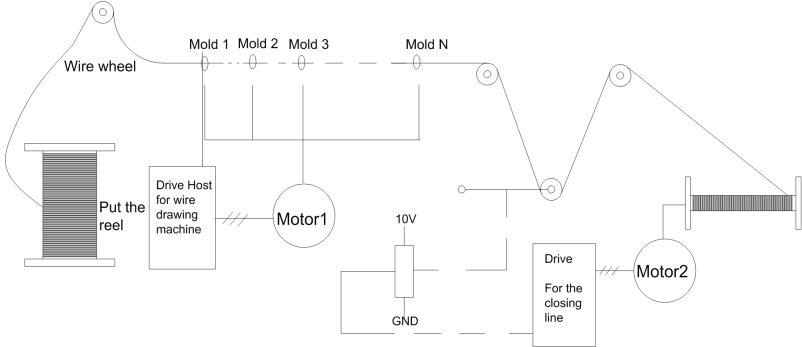


Fig 2-1 Water tank type wire drawing machine (1)

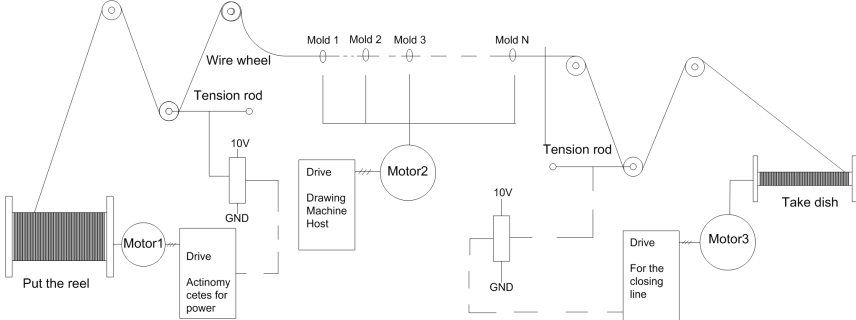


Fig 2-1 Water tank type wire drawing machine (2)

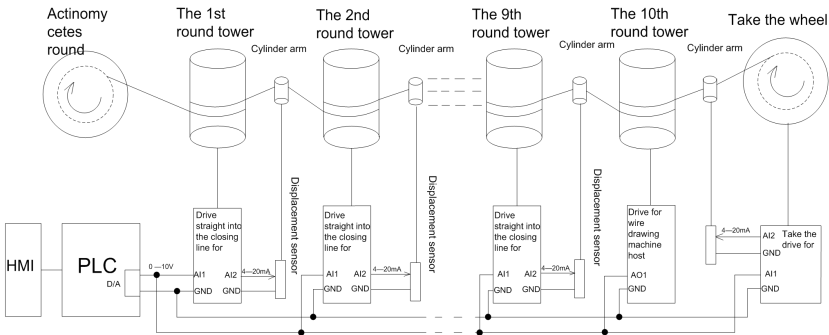


Fig 2-1 Straight line wire drawing machine (3)

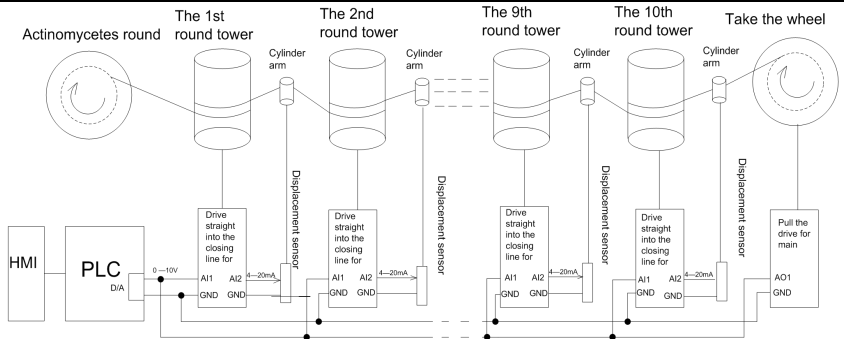


Fig 2-1 Straight line wire drawing machine(4)

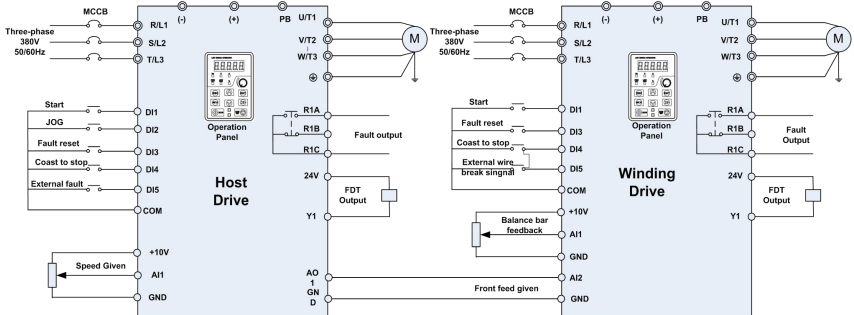


Fig 2-2 Wiring diagram of inverter for water tank type wire drawing machine

2.2 Terminal configuration

2.2.1 Main Circuit Terminals

a: FR200L 0.75~30KW Main Circuit Terminals

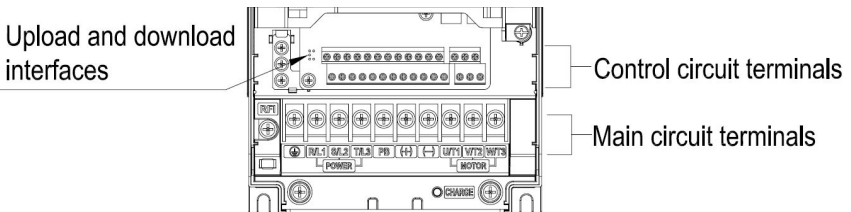


Fig 2-3 0.75~30kW Main Circuit Terminals diagram

Table 2-1 Functions of Inverter Main Circuit Terminals

Terminal Label	Description
R/L1、S/L2、T/L3	AC Power Input Terminal, connected to three-phase 380V AC power.
U/T1、V/T2、W/T3	Inverter AC output terminal, connected to three-phase AC motor
(+), (-)	Respectively to be positive and negative terminal of internal DC bus
PB	Braking resistor connection terminals, one end connected to (+), the other end of PB.
	Ground terminal, connected to the earth.

2.2.2 FR200L Control Circuit Terminals

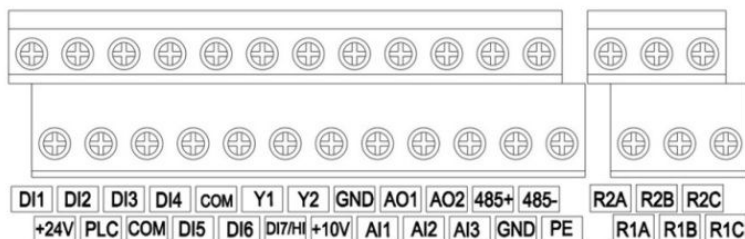


Fig 2-4 Control Circuit Terminals

Table 2-2 Functions of Inverter Terminals control circuit terminals

Type	Terminal Symbol	Terminal Name	Description
Power Supply	+10V-GND	+ 10V Power Supply	Output +10V Power Supply, Maximum Output Current: 10mA. Generally use for power supply of external potentiometer, resistance range of potentiometer: 1~5kΩ
	+24V-COM	24V Power Supply	Output +24V power supply, generally use for power supply of digital input/output terminal and external sensor, maximum output current: 200mA.
	PLC	External Power Input Terminal	Factory default in connection with +24V,when using an external signal to drive DI1~DI7, PLC need to be connected to external power, and disconnected with +24V power terminal.
Analog Input	AI1-GND	Analog Input Terminal 1	Input Range: DC 0~10V/0~20mA, selected by AI1、AI2 toggle switches on control board. Input Impedance:250kΩ for voltage input, 250Ω for current input.
	AI2-GND	Analog Input Terminal 2	
	AI3-GND	Analog Input Terminal 3	
Digital Input	DI1- COM	Digital Input Terminal 1	Maximum input frequency: 200Hz Input Impedance: 2.4kΩ Voltage Range of level-input:9V~30V
	DI2- COM	Digital Input Terminal 2	
	DI3- COM	Digital Input Terminal 3	
	DI4- COM	Digital Input Terminal 4	
	DI5- COM	Digital Input Terminal 5	

	DI6- COM	Digital Input Terminal 6	
	DI7/HI-COM	Digital Input Terminal 7 or high-speed pulse input	Besides the features of DI1~DI6, DI7 also can be the channel of high-speed pulse input. Maximum input frequency: 100kHz.
Analog Output	AO1-GND	Analog Output Terminal 1	Output range: DC 0~10V/0~20mA, selected by A01、A02 toggle switches on control board. Impedance required $\geq 10k\Omega$
	AO2-GND	Analog Output Terminal 2	
Digital Output	Y1-COM	Open Collector Output 1	Voltage Range: 0~24V Current Range: 0~50mA
	Y2/HO-COM	Open Collector Output 2 or high-speed pulse output	Apart from Y1 characteristics, Y2 also can be the channel of high-speed pulse input. Maximum output frequency: 100kHz.
Relay Output	R1A-R1C	normal open terminal	Contact driving ability: AC250V, 3A, COS ϕ =0.4。 DC 30V, 1A
	R1B-R1C	normal close terminal	
	R2A-R2C	normal open terminal	
	R2B-R2C	normal close terminal	
485 Communication	485+-485-	485 Communication Terminals	Speed: 4800/9600/19200/38400/57600/115200bps. RS485 toggle switch on control board, setting the terminal matching-resister
	GND	485 Communication Shield Ground	
Shielded	PE	Shield Grounding	It's use for grounding the shield of terminal-wire
Aid Interface		External Keyboard Interface	When connected to operation board, the longest communication distance is up to 50m, adopt the standard network cable (RJ45)
	UP/DOWNLOAD	Parameter Copy Card Interface	

Chapter 3 Function Parameters

3.1 Basic Function Parameters

Table 3-1 Basic Function Parameters

Function Code	Name	Descriptions	Default Value	Attribute
F00 Group: System Parameters				
F00.00	User password	0~65535	0	×
F00.04	Default Value Control	0: Null	0	×
		1: Factory Reset(Excluding motor parameters)		
		2:Clear the record information of fault		
		3:ckup user's current parameters		
		4:User's backup parameters were restored		
Group F01: Frequency command				
F01.08	(Maximum frequency(Fmax)	20.00~600.00Hz	75.00Hz	×
F01.09	Upper limit frequency(Fup)	Fdown~Fmax	75.00Hz	×
F01.10	Lower limit frequency(Fdown)	0.00~Fup	0.00Hz	×
F01.11	Lower limit frequency	0: Run at Fup 1: After running time of lower limit frequency, it will run on speed of 0.	0	×
F01.12	Running time of lower limit frequency	0.0~6000.0s	60.0s	×
Group F02: Start/Stop Control				
F02.00	Run command	0: Keypad control (LED off)	1	×
		1: Terminal control (LED on)		
		2: Communication control (LED blinking)		
Group F03: Accel/Decel Parameters				
F03.00	Accel time 1	0.0~6000.0s	40.0s	△
F03.01	Decel time 1	0.0~6000.0s	40.0s	△
F03.08	Jog accel time	0.0~6000.0s	8.0s	△
F03.09	Jog decel time	0.0~6000.0s	8.0s	△
Group F04 Digital Input				
F04.00	Function of terminal DI1	0: No function	1	×
F04.01	Function of terminal DI2	1: Running forward (FWD)	2	×
F04.02	Function of terminal DI3	2: Running reverse (REV)	7	×
F04.03	Function of terminal DI4	3: Three-wire control	6	×
F04.04	Function of terminal DI5	4: JOG forward	39	×
		5: JOG reverse (RJOG)		
		6: Coast to stop		
		7: Fault reset (RESET)		
				
		39: line break fault		

Group F05 Digital Output				
F05.00	Y1 output function	0: No output	1	×
F05.01	Y2 output function	1: Drive is running	3	
F05.02	Relay 1 output function	2: Inverter fault	2	×
		3:Frequency-level detection (FDT1)		
		4:Frequency-level detection (FDT2)		
				
		20: Underload alarm		
Group F07 Analog and Pulse Output				
F07.00	AO1 output function	0: No output	1	×
F07.01	AO2 output function	1: Output frequency	2	×
F07.02	Y2/HO output function (when used as HO)	2: Command frequency	1	×
		3: Output current		
		4: Output voltage		
		5: Output power		
		6: Bus voltage		
		7: +10V		
		8: keypad potentiometer		
		9:AI1		
		10:AI2		
		11:AI3		
		12:HI		
		13: Output torque		
Group F08 Parameters of Motor 1				
F08.01	Power rating of motor 1	0.10~600.00kW	Model	×
F08.02	Rated voltage of motor 1	60~660V	defined	×
F08.03	Rated current of motor 1	0.1~1500.0A	Model	×
F08.04	Rated frequency of motor 1	20.00~Fmax	defined	×
F08.05	Rated speed of motor 1	1~30000	Model	×
F08.06	Wiring mode of motor 1	0: Y	defined	×
		1: Δ	Model	
F08.07	Rated power factor of motor 1	0.50~0.99	defined	×
F08.08	Stator resistance R1 of async motor 1	0.001~65.535Ω	Model	×
F08.09	Rotor resistance R2 of async motor 1	0.001~65.535Ω	defined	×
F08.10	Leakage inductance L1 of async motor 1	0.001~65.535mH	Model	×
F08.11	Mutual inductance L2 of asynchronous motor 1	0.1~6553.5mH	defined	×
F08.12	No-load current of async motor 1	0.1~1500.0A	Model	×
F08.13	Field weakening coeff 1 of async motor 1	0.0~100.0	87%	×
F08.14	Field weakening coeff 2 of async motor 1	0.0~100.0	75%	×
F08.15	Field weakening coeff 3 of async motor 1	0.0~100.0	70%	×
F08.30	Autotuning of motor 1	0: No autotuning	0	×
		1: Static autotuning of async motor		

		2: Rotary autotuning of async motor		
Group F09 V/f Control Parameters of Motor 1				
F09.00	V/f curve setting	0: Linear V/f	3	×
		1: Multi-stage V/f		
		2: 1.2nd power V/F		
		3: 1.4th power V/F		
		4: 1.6th power V/F		
		5: 1.8th power V/F		
		6: 2.0nd power V/F		
		7: V/F complete separation		
		8: V/F half separation		
F09.01	Torque boost	0.0~30.0% 0.0%: (fixed torque boost)	Model defined	△
F09.02	Cut-off frequency of torque boost	0.00~Maximum frequency	50.00Hz	△
F09.03	Multi-point V/F frequency 1(F1)	0.00~F09.05	0.00Hz	△
F09.04	Multi-point V/F voltage 1 (V1)	0.0~100.0	0.0%	△
F09.05	Multi-point V/F frequency 2(F2)	F09.03~F09.05	0.00Hz	△
F09.06	Multi-point V/F voltage 2 (V2)	0.0~100.0	0.0%	△
F09.07	Multi-point V/F frequency 3(F3)	F09.05~F09.09	0.00Hz	△
F09.08	Multi-point V/F voltage 3 (V3)	0.0~100.0	0.0%	△
F09.09	Multi-point V/F frequency 4(F4)	F09.07~rated motor frequency	50.00Hz	△
F09.10	Multi-point V/F voltage 4 (V4)	0.0~100.0 Ue=100.0%	100.0%	△
F09.11	V/F slip compensation gain	0.0~300.0%	0.0%	△
F09.12	Stator voltagedrop compensation gain	0.0~200.0%	100.0%	△
F09.13	Excitation boost gain	0.0~200.0%	100.0%	△
F09.14	Oscillation Suppression	0.0~300.0%	0.0%	△
Group F11 Protection Parameters				
F11.00	Current limit control	0: Current limit disabled	2	×
		1: Current limit mode 1		
		2: Current limit mode 2		
F11.01	Current limit	100.0~200.0%	150.0%	×
F11.02	Frequency decreasing time(limit current in constant speed operation)	0.0~6000.0s (Valid in mode 1)	5.0s	△
F11.03	Current limit mode 2 proportion gain	0.1~100.0%	3.0%	△
F11.04	Current limit mode 2 integral time	0.000~1.000s	0.010s	△
F11.05	Overvoltage Stall Control	0:Overvoltage stall disabled	1	×
		1:Overvoltage stall mode 1		
		2: Overvoltage stall mode 2		
F11.06	Overvoltage Stall Voltage	120.0~150.0%	130.0%	×
F11.07	Overvoltage Stall	0.1~100.0%	3.0%	△

	Mode 2 Proportion Gain			
F11.08	Overvoltage Stall Mode 2 Integral Time	0.000~1.000s	0.010s	△
F11.10	Protection action 1	Unit's place: Bus undervoltage	03000	×
		0: Fault reported and coast to stop		
		1: Stop according to the stop mode		
		2: Fault reported but continue to run		
		3: Fault protection disabled		
		Ten's digit :Power input phase Loss (Err09)(Same as unit's place)		
		Hundred's digit :Power output phase loss(Err10)(Same as unit's place)		
		Thousand's digit:Motor overload (Err11)(Same as unit's place)		
F11.11	Protection action 2	Ten thousand's digit:Inverter overload(Err11)(Same as unit's place)	00000	×
		External equipment fault (Err13)		
		0: Fault reported and coast to stop		
		1: Stop according to the stop mode		
		2: Fault reported but continue to run		
		Ten's digit: EEPROM read/write fault (Err15) (Same as unit's place)		
		Hundred's digit: Communication overtime error (Err18) (Same as unit's place)		
		Thousand's digit: PID feedback loss (Err19) (Same as unit's place)		
F11.12	Protection action 3	Ten thousand's digit: Continuous running time reached (Err20) (Same as unit's place)	00000	×
		Unit's place: Module temperature detection disconnection (Err24)		
		0: Fault reported and coast to stop		
		1: Stop according to the stop mode		
		2: Fault reported but continue to run		
		Ten's digit: Load becoming 0 (Err25) (Same as unit's place)		

		Hundred's digit:: Reserved		
		Thousand's digit: Reserved		
		Ten thousand's digit: Reserved		
F11.14	Frequency selection for continuing to run upon fault	0: Current running frequency 1: Set frequency 2: Frequency upper limit 3: Frequency lower limit 4: Backup frequency upon abnormality	0	×
F11.15	Backup frequency upon abnormality	0.00~Fmax	0.00Hz	×
F11.17	Motor overload protection time	30.0~300.0s	60.0s	×
F11.18	Overload alarm	Unit's place: detection option: 0: Always detect 1: Detect at constant speed only Ten's digit : compared object 0: Rated current of motor 1: Rated current of drive	00	×
F11.19	Overload alarm threshold	20.0~200.0%	130.0%	×
F11.20	Overload alarm activated time that exceeding threshold	0.1~60.0s	5.0s	×
F11.21	Inverter overheat warning threshold	50.0~100.0℃	70.0℃	×
F11.22	Detection level of power loss	5.0~100.0%	20.0%	×
F11.23	Detection time of power loss	0.1~60.0s	5.0s	×
F11.24	Action selection at instantaneous power failure	0: Disabled 1: Enabled	1	×
F11.25	Decel time at instantaneous power failure	0.0~6000.0s	5.0s	△
F11.26	Rapid current limit	0: Disabled 1: Enabled	0	×
F11.27	Times of automatic reset	0~20	0	×
F11.28	Interval of automatic reset	0.1~100.0s	1.0s	×
F11.29	DO action during fault auto reset	0: Not act 1: Act	0	×
Group U00 Status Monitoring				
U00.00	Running frequency	0.00~Fup	0.00Hz	⊙
U00.01	Set frequency	0.00~Fmax	0.00Hz	⊙
U00.02	Output voltage	0~660V	0.0V	⊙
U00.03	Output current	0.0~3000.0A	0.0A	⊙
U00.04	Output power	-3000.0~3000.0kW	0.0kW	⊙
U00.05	Estimated Motor Speed	0~60000rpm	0rpm	⊙
U00.06	Bus voltage	0~1200V	0V	⊙
U00.07	Synchronous Frequency	0.00~Fup	0.00Hz	⊙

U00.08	PLC step	1~15	1	⊙
U00.09	Program Operation Time	0.0~6000.0s(h)	0.0s(h)	⊙
U00.10	PID set	0~60000	0	⊙
U00.11	PID feedback	0~60000	0	⊙
U00.12	Status of DI1~DI5 digital input terminal	DI5 DI4 DI3 DI2 DI1	00000	⊙
U00.13	Status of DI6~DI7 digital input terminal	DI7 DI6	00	⊙
U00.14	Status of digital output terminal	R2 R1 Y2 Y1	0000	⊙
U00.15	AI1 input	0.0~100.0%	0.0%	⊙
U00.16	AI2 input	0.0~100.0%	0.0%	⊙
U00.17	AI3 input	-100.0~100.0%	0.0%	⊙
U00.18	Keypad potentiometer input	0.0~100.0%	0.0%	⊙
U00.19	HI input	0.00~100.00kHz	0.00kHz	⊙
U00.20	AO1 output	0.0~100.0%	0.0%	⊙
U00.21	AO2 output	0.0~100.0%	0.0%	⊙
U00.22	HO output	0.00~100.00kHz	0.00kHz	⊙
U00.23	Temperature of inverter	-40.0℃~120.0℃	0.0℃	⊙
U00.24	Accumulative power-on time	0~65535min	0min	⊙
U00.25	Accumulative running time	0~6553.5min	0.0min	⊙
U00.26	Cumulative power-on time	0~65535h	0h	⊙
U00.27	Cumulative running time	0~65535h	0h	⊙
U00.28	Count value	0~65535	0	⊙
U00.29	Length value	0~65535m	0m	⊙
U00.30	Linear speed	0~65535m/min	0m/Min	
U00.31	Output torque	0.0~300.0%	0.0%	⊙
Group U01 Fault Record				
U01.00	Fault type	0: No fault	0	⊙
		Err01: Accel overcurrent		
		Err02: Decel overcurrent		
		Err03: Constant-speed overcurrent		
		Err04: Accel overvoltage		
		Err05: Decel overvoltage		
		Err06: Constant-speed overvoltage		
		Err07: Bus undervoltage		
		Err08: Short circuit		
		Err09: Power input phase loss		
		Err10: Power output phase loss		
		Err11: Motor overload		
		Err12: Inverter overload		
		Err13: External equipment fault		
		Err14: Module overheat		
		Err15: EEPROM read/write fault		
		Err16: Motor auto-tuning cancelled		

		Err17: Motor auto-tuning fault		
		Err18: Communication overtime error		
		Err19: PID feedback loss		
		Err20: Continuous running time reached		
		Err21: Parameter upload fault		
		Err22: Parameter download fault		
		Err23: Braking unit fault		
		Err24: Module temperature detection disconnection		
		Err25: Load becoming 0		
		Err26: With-wave current limit fault		
		Err27: Inverter soft-start relay is off		
		Err28: Software version compatibility fault		
		Err29: Hardware overcurrent		
		Err30: Hardware overvoltage		
		Err31: Line break fault		
U01.01	Running frequency when the latest fault occurred	0.00~Fup	0.00Hz	⊙
U01.02	Output current when the latest fault occurred	0.0~3000.0A	0.0A	⊙
U01.03	Bus voltage when the latest fault occurred	0~1200V	0V	⊙
U01.04	Cumulative running time when the latest fault occurred	0~65535h	0h	⊙
U01.05	Code of previous fault	Same as U01.00	0	⊙
U01.06	Running frequency when previous fault occurred	0.00~Fup	0.00Hz	⊙
U01.07	Output current when previous fault occurred	0.0~3000.0A	0.0A	⊙
U01.08	Bus voltage when previous fault occurred	0~1200V	0V	⊙
U01.09	Cumulative running time when previous fault occurred	0~65535h	0h	⊙
U01.10	Before-previous fault code	Same as U01.00	0	⊙
U01.11	Running frequency when before-previous fault occurred	0.00~Fup	0.00Hz	⊙
U01.12	Output current when before-previous fault occurred	0.0~3000.0A	0.0A	⊙
U01.13	Bus voltage when before-previous fault occurred	0~1200V	0V	⊙
U01.14	Cumulative running time	0~65535h	0h	⊙

	when before-previous fault occurred			
Group H00: Special Function Code for wire drawing machine				
H00.00	Type of wire drawing machine	0: host drive in water tank wire drawing machine	1	×
		1: Winding drive in water tank wire drawing machine		
		2: Unwinding drive		
		3: Straight line wire drawing machine		
H00.01	Balance bar centre point setting	0.0~100.0%	50.0%	△
H00.02	Balance bar feedback source	0: AI1 1: AI2 2: Communication given 3: HI pulse input	0	×
H00.03	Proportional gain P	0.0~100.0%	40.0%	△
H00.04	Integral time Ti	0.00~300.00s	0.00	△
H00.05	PID effect upper limit	PID effect lower limit~100.0%	100.0%	×
H00.06	PID effect lower limit	-100.0%~PID PID effect upper limit	-100.0 %	×
H00.07	Feedforward frequency given source	0: Digital given (Setting H00.08) 1: AI1 2: AI2 3: Communication given 4: HI pulse input	Winding :2 Unwindi ng:0 Straight line:2	×
H00.08	Feedforward frequency digital given	0.0%~100.0%	100.0%	△
H00.09	Roll diameter coefficient K upper limit	0.0%~600.0%	Winding :300.0 % Unwindi ng:100. 0% Straight line:300 .0%	△
H00.10	Roll diameter coefficient K starting value	0.0%~ feedforward gain limit	Winding :100.0 % Unwindi ng:0.0 % Straight line:200 .0%	△
H00.11	Smooth starting time	0.0~120.0s	Winding: 1.0s Unwindin g:0.0s Straight line:0.0s	△
H00.12	Smooth start K increment per second	0.00~100.00%	0.60%	△
H00.13	Roll diameter coefficient range 1	0.0%~Roll diameter coefficient range 2	2.0%	△

H00.14	Roll diameter coefficient range 2	Roll diameter coefficient range 1~3	10.0%	△
H00.15	Roll diameter coefficient range 3	Roll diameter coefficient range 2~4	20.0%	△
H00.16	Roll diameter coefficient range 4	Roll diameter coefficient range 3~5	30.0%	△
H00.17	Roll diameter coefficient range 5	Roll diameter coefficient range 4~100.0%	35.0%	△
H00.18	Roll diameter coefficient K increment 1	0.00~100.00%	0.05%	△
H00.19	Roll diameter coefficient K increment 2	0.00~100.00%	0.08%	△
H00.20	Roll diameter coefficient K increment 3	0.00~100.00%	0.50%	△
H00.21	Roll diameter coefficient K increment 4	0.00~100.00%	1.00%	△
H00.22	Roll diameter coefficient K increment 5	0.00~100.00%	6.00%	△
H00.23	Wire break control mode	Units: Wire break determine mode 0: Automatic determine 1: External signal Tens: Wire break VFD statue 0: Constant running 1: Stop after the delay 2: Coast to stop	Winding :21 Unwinding:11 Straight line:21	×
H00.24	Wire break determine delay time after starting	0.0~20.0s	5.0s	△
H00.25	Wire break automatic determine time	0.0~20.0s	1.0s	△
H00.26	Wire break feedback lower limit value	0.0%~Wire break feedback upper limit value	5.0%	△
H00.27	Wire break feedback upper limit value	Wire break feedback lower limit value ~100.0%	95.0%	△
H00.28	Running time after wire break	0.0~120.0s	10.0s	△
H00.29	Running frequency after wire break	0.00~60.00Hz	5.00Hz	△
H00.30	Synthesized frequency output upper limit	Synthesized frequency output lower limit~100.0%	100.0%	×
H00.31	Synthesized frequency output lower limit	-100.0%~Synthesized frequency output upper limit	Winding: 0.0% Unwinding:-15.0% Straight line:0.0%	×
H00.32	Modulator function	0:Positive 1:Negative	Winding :0 Unwinding:1 Straight line:1	×

3.2 Group H00 Function Cde

H00.00	Type of wire drawing machine	0: host drive in water tank wire drawing machine	1	×
		1: Winding drive in water tank wire drawing machine		

		2: Unwinding drive		
		3: Straight line wire drawing machine		

0: 0: host drive in water tank wire drawing machine

Used in water tank type wire drawing machine host or straight line wire drawing machine host

1: Winding drive in water tank wire drawing machine

Used in winding of water tank wire drawing machine or winding of straight line wire drawing machine

2: Unwinding drive

Used for unwinding

3: Straight line wire drawing machine

Used in straight line wire drawing machine

H00.01	Balance bar centre point setting	0.0%~100.0%	50.00%	△
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To set the position of balance bar center point with the feedback value

H00.02	Balance bar feedback source	0: AI1 1: AI2 2: Communication given 3: HI pulse input	0	×
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0: AI1

Feedback signal of balance bar set by AI1

1: AI2

Feedback signal of balance bar set by AI2

2: Communication given

Feedback signal of balance bar set by communication source

3: HI pulse input

Feedback signal of balance bar set by HI pulse input

H00.03	Proportional gain P	0.0~100.0%	40.0%	△
H00.04	Integral time Ti	0.00~300.00s	0.00	△

Proportional gain P

It decides the regulating intensity of the PID regulator. The higher the P is, the larger the regulating intensity is. The value 100.0 indicates when the deviation between PID feedback and PID setting is 100.0%; the adjustment amplitude of the PID regulator on the output frequency reference is the maximum frequency.

Integral time Ti:

It decides the integral regulating intensity. The shorter the integral time is, the larger the regulating intensity is. When the deviation between PID feedback and PID setting is 100.0%, the integral regulator performs continuous adjustment for the time set in FA-06. Then the adjustment amplitude reaches the maximum frequency.

H00.05	PID effect upper limit	PID effect lower limit~100.0%	100.0%	×
H00.06	PID effect lower limit	-100.0%~PID effect upper limit	-100.0%	×

PID output frequency is limited H00.05 & H00.06

100.0% corresponding to maximum frequency

H00.07	Feedforward frequency given source	0: Digital given (Setting H00.08) 1: AI1 2: AI2 3: Communication given 4: HI pulse input	Winding:2 Unwinding: 0 Straight line:2	×
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To select feedforward frequency given source

0: Digital given

Setting by H00.08

1: AI1

Setting by input AI1

2: AI2

Setting by input AI2

3: Communication given

Setting by the communication

4: HI pulse input

Setting by HI pulse input

H00.08	Feedforward frequency digital given	0.0%~100.0%	100.0%	△
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When H00.07 set to be 0, H00.08 set the value of Feedforward frequency

H00.09	Roll diameter coefficient K upper limit	0.0%~600.0%	Winding:300.0% Unwinding:100.0% Straight line:300.0%	△
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The upper limit value of roll diameter coefficient K

H00.10	Roll diameter coefficient K starting value	0.0%~ feedforward gain limit	Winding:40.0% Unwinding:0.0% Straight line: 300.0%	△
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The initial value when inverter start roll diameter coefficient K

H00.11	Smooth starting time	0.0~120.0s	Winding:1.0s Unwinding:0.0s Straight line:0.0s	△
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In smooth starting time, PI does not calculate, inverter start to accelerate and search a suitable roll diameter coefficient K according to deviation E because of the effect of feedforward, then deviation E tends to be 0. When reach smooth starting time, PI start to adjust so as to avoid bigger deviation and vibrate, and accelerate to reach the target value.

Note: When balance bar position is over the centre position in smooth starting time, inverter will exit PI soft start state automatically then entry PI adjustment.

H00.12	Smooth start K increment per second	0.00~100.00%	0.60%	△
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In smooth starting time, roll diameter coefficient adjust the increment per second according to balance bar, bigger value indicate faster adjustment

H00.13	Roll diameter coefficient range 1	0.00~100.00%	2.0%	△
H00.14	Roll diameter coefficient range 2	0.0%~Roll diameter coefficient range 2	10.0%	△
H00.15	Roll diameter coefficient range 3	Roll diameter coefficient range 1~3	20.0%	△
H00.16	Roll diameter coefficient range 4	Roll diameter coefficient range 2~4	30.0%	△
H00.17	Roll diameter coefficient range 5	Roll diameter coefficient range 3~5	35.0%	△
H00.18	Roll diameter coefficient K increment 1	Roll diameter coefficient range 4~100.0%	0.05%	△
H00.19	Roll diameter coefficient K increment 2	0.00~100.00%	0.08%	△
H00.20	Roll diameter coefficient K increment 3	0.00~100.00%	0.50%	△
H00.21	Roll diameter coefficient K increment 4	0.00~100.00%	1.00%	△
H00.22	Roll diameter coefficient K increment 5	0.00~100.00%	6.00%	△

Roll diameter coefficient will be adjusted automatically corresponding to the incremental according to the scope of balance bar. No adjustment below range 1, adjust with increment 1

Between range 1 and 2, adjust with increment 2 between range 2 and 3, adjust with increment 3 between range 3 and 4, adjust with increment 4 between 4 and 5, adjust with increment 5 above range 5.

H00.23	Wire break control mode	Units: Wire break determine mode 0: Automatic determine 1: External signal Tens: Wire break VFD statue 0: Constant running 1: Stop after the delay 2: Coast to stop	Winding:21 Unwinding: 11 Straight line:21	×
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Units: Wire break determine mode

0: Automatic determine

When feedback signal is lower than H00.26(Wire break feedback lower limit value) or bigger than H00.27(Wire break feedback upper limit value), and continue H00.25(Running time after wire break), automatic determine is valid.

1: External signal

Digital terminal set to be 39(wire break fault),and continue H00.10, wire break is valid

Tens: Wire break VFD statue

0: Constant running

When wire break single is valid, keypad display Arn35 alarm, then continue to run

1: Stop after the delay

When wire break single is valid, keypad display Arn35 alarm, inverter continue to run with frequency setting by H00.20, and after the time setting by H00.28, inverter decelerate to stop and report wire break fault Err35

2: Coast to stop

When wire break single is valid, report wire break fault Err35, and cost to stop

H00.24	Wire break determine delay time after starting	0.0~20.0s	5.0s	△
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When inverter run, after the time of H00.24, inverter start to detect wire break single

H00.25	Wire break automatic determine time	0.0~20.0s	1.0s	△
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When H00.23 setting is 0, when the feedback value of balance bar is lower than H00.26 or bigger than H00.27, and continue the setting time, the wire break single is valid.

H00.26	Wire break feedback lower limit value	0.0%~ Wire break feedback upper limit value	5.0%	△
H00.27	Wire break feedback upper limit value	Wire break feedback lower limit value ~100.0%	95.0%	△

When H00.23 setting is 0, when balance bar is lower than H00.26 or bigger than H00.27, wire break timing start

H00.28	Running time after wire break	0.0~120.0s	10.0s	△
H00.29	Running frequency after wire break	0.00~60.00Hz	5.00Hz	△

When wire break single is valid, inverter run at the frequency of H00.29 and stop at the time of H00.29.

H00.30	Synthesized frequency output upper limit	Synthesized frequency output lower limit ~100.0%	100.0%	×
H00.31	Synthesized frequency output lower limit	-100.0%~ Synthesized frequency output upper limit	Winding:0.0 % Unwinding:-1 5.0% Straight line:0.0%	×

The two function codes is synthesized frequency limit, synthesized frequency=Roll diameter coefficient * host(feedforward) frequency + PI output frequency

H00.32	Modulator function	0:Positive 1:Negative	Winding:0 Unwinding: 1 Straight line:1	×
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0: Positive

When feedback signal is lower PID given, inverter need to increase output frequency make PID balance

When feedback signal is bigger than PID given, inverter need to decrease output frequency to make PID balance

1. Negative

When feedback signal is lower than PID given, inverter need to decrease output frequency to make PID balance

When feedback signal is bigger than PID given, inverter need to increase output frequency to make PID balance

Chapter 4 Troubleshooting

FR100L&FR200L inverter provides a number of warning information and protection, when a fault occurs, the protective function is activated, the inverter will stop output, inverter fault relay contact, and in the inverter displays the fault code on the display panel. Before seeking service user can press the self-examination tips in this section, analyze problems, and identify solutions. If the problem still cannot be excluded, seek services, or contact the dealer you purchase the drive with my company.

Display	Fault Name	Possible Causes	Solutions
Err01	Accel overcurrent	1: The output circuit is grounded or short circuited. 2: The acceleration time is too short. 3: Manual torque boost or V/F curve is not appropriate. 4: The voltage is too low. 5: The startup operation is performed on the rotating motor. 6: A sudden load is added during acceleration. 7: The AC drive model is of too small power class.	1: Eliminate external faults. 2: Increase the acceleration time. 3: Adjust the manual torque boost or V/F curve. 4: Adjust the voltage to normal range. 5: Select rotational speed tracking restart or start the motor after it stops. 6: Remove the added load. 7: Select an AC drive of higher power class
Err02	Decel overcurrent	1: The output circuit is grounded or short circuited. 2: The deceleration time is too short. 3: The voltage is too low. 4: A sudden load is added during deceleration. 5: The braking unit and braking resistor are not installed.	1: Eliminate external faults. 2: Increase the deceleration time. 3: Adjust the voltage to normal range. 4: Remove the added load. 5: Install the braking unit and braking resistor.
Err03	Constant-speed overcurrent	1: The output circuit is grounded or short circuited. 2: The voltage is too low. 3: A sudden load is added during operation. 4: The AC drive model is of too small power class.	1: Eliminate external faults 2: Adjust the voltage to normal range. 3: Remove the added load 4: Select an AC drive of higher power class.
Err04	Accel overvoltage	1: The input voltage is too high. 2: An external force drives the motor during acceleration. 3: The acceleration time is too short. 4: The braking unit and braking resistor are not installed.	1: Adjust the voltage to normal range. 2: Cancel the external force or install a braking resistor. 3: Increase the acceleration time. 4: Install the braking unit and braking resistor.

Err05	Decel overvoltage	1: The input voltage is too high. 2: An external force drives the motor during deceleration. 3: The deceleration time is too short. 4: The braking unit and braking resistor are not installed.	1: Adjust the voltage to normal range. 2: Cancel the external force or install the braking resistor. 3: Increase the deceleration time. 4: Install the braking unit and braking resistor.
Err06	Constant-speed overvoltage	1: The input voltage is too high 2: An external force drives the motor during deceleration.	1: Adjust the voltage to normal range. 2: Cancel the external force or install the braking resistor.
Err07	Bus undervoltage	1: Instantaneous power failure occurs on the input power supply. 2: The AC drive's input voltage is not within the allowable range. 3: The bus voltage is abnormal. 4: The rectifier bridge and buffer resistor are faulty. 5: The drive board is faulty. 6: The main control board is faulty.	1: Reset the fault. 2: Adjust the voltage to normal range. 3: Contact the agent or Frecon.
Err08	Short circuit	1: The output circuit is grounded or short circuited. 2: The connecting cable of the motor is too long. 3: The module overheats. 4: The internal connections become loose. 5: The main control board is faulty 6: The drive board is faulty. 7: The inverter module is faulty.	1: Eliminate external faults. 2: Install a reactor or an output filter. 3: Check the air filter and the cooling fan. 4: Connect all cables properly. 5: Contact the agent or Frecon.
Err09	Power input phase loss	1: The three-phase power input is abnormal. 2: The drive board is faulty. 3: The lightning board is faulty. 4: The main control board is faulty.	1: Eliminate external faults. 2: Contact the agent or FRECON.
Err10	Power output phase loss	1: The cable connecting the AC drive and the motor is faulty. 2: The AC drive's three-phase outputs are unbalanced when the motor is running. 3: The drive board is faulty. 4: The module is faulty.	1: Eliminate external faults. 2: Check whether the motor Three-phase winding is normal. 3: Contact the agent or Frecon.
Err11	Motor overload	1: F11-17 is set improperly. 2: The load is too heavy or locked-rotor occurs on the motor. 3: The AC drive model is of too	1: Set F11-17 correctly. 2: Reduce the load and check the motor and the mechanical condition. 3: Select an AC drive of

		small power class.	higher power class.
Err12	Inverter overload	1: The load is too heavy or locked-rotor occurs on the motor. 2: The AC drive model is of too small power class.	1: Reduce the load and check the motor and mechanical condition. 2: Select an AC drive of higher power class.
Err13	External equipment fault	1: External fault signal is input via DI.	Reset the operation.
Err14	Module overheat	1: The ambient temperature is too high. 2: The air filter is blocked. 3: The fan is damaged. 4: The thermally sensitive resistor of the module is damaged. 5: The inverter module is damaged.	1: Lower the ambient temperature. 2: Clean the air filter. 3: Replace the damaged fan. 4: Replace the damaged thermally sensitive resistor. 5: Replace the inverter module.
Err15	EEPROM read/write fault	The EEPROM chip is damaged.	Replace the main control board.
Err16	Motor auto-tuning cancelled	Since the identification process, press STOP / RST key	Press STOP / RST key to reset
Err17	Motor auto-tuning fault	1: the motor and the inverter output terminals are not connected 2: The motor does not disengage the load 3: The electrical fault	1: check the connection between the inverter and motor 2: The motor is disengaged load 3: Check the motor
Err18	Communication overtime error	1: The PC is not working properly 2: The communication line is not normal 3: F15 set communication parameters set incorrectly	1: Check the PC Connection 2: Check the communication cable 3: The communication parameters are set correctly
Err19	PID feedback loss	PID feedback set value is less than F13.24	Check the PID feedback signal or set to an appropriate value F13.24
Err20	Continuous running time reached	Set the running time to reach this function	reference F05.14 Description
Err21	Parameter upload fault	1: Is not installed or is not plugged parameter copy card 2: Parameter copy card anomalies 3: The control board abnormalities	1: a copy of the card is properly installed parameters 2: for technical support 3: for technical support
Err22	Parameter download fault	1: Is not installed or is not plugged parameter copy card 2: Parameter copy card anomalies 3: The control board abnormalities	1: A copy of the card is properly installed parameters 2: For technical support 3: For technical support
Err23	Braking unit fault	1: The brake line failure or damage the brake pipe 2: An external braking resistor is too small	1: Check the brake unit, replace the brake pipe 2: Increasing the braking resistor

Err24	Module temperature detection disconnection	The temperature sensor failure or cable break	For technical support
Err25	Load becoming 0	The AC drive running current is lower than F11.22	Check that the load is disconnected or the setting F11-22 and F11-23 is correct.
Err26	With-wave current limit fault	1: The load is too heavy or locked rotor occurs on the motor. 2: The AC drive model is of too small power class.	1: Reduce the load and check the motor and mechanical condition. 2: Select an AC drive of higher power class.
Err27	Inverter soft-start relay is off	1: The grid voltage is too low 2: Rectifier module failure	1: Check the grid voltage 2: Demand for technical support
Err28	Software version compatibility fault	1: The upper and lower transmission module parameters in the parameter version of the control panel version mismatch.	re-upload module parameters to pass down
Err29	Hardware overcurrent	1: The acceleration and deceleration time is too short 2: The motor parameters are not accurate 3: The drive hardware failure	1: To extend the deceleration time 2: Set the correct motor parameters 3: The demand for technical support
Err30	Hardware overvoltage	1: The deceleration time is too short 2: Do not install braking resistor 3: The drive hardware failure	1: To extend the deceleration time 2: The installation of a braking resistor 3: The demand for technical support
Err35	Wire break fault	Wire break	Re-connect the wire

Chapter 5 Parameter setting reference

5.1 Parameter setting reference of drive for water tank type wire drawing machine host

Function code	Parameter Name	Recommended setting value
F01.01	Master Frequency Command Source	2: AI1
F01.08	Maximum frequency (Fmax)	75.00Hz
F01.09	Upper limit frequency (Fup)	55.00Hz
F02.00	Run command	1: Terminal control (LED on)
F02.02	Reverse-proof action	0: Reverse enabled
F02.12	Stop mode	0: Ramp to stop
F03.00	Accel time 1	40.0s
F03.01	Decel time 1	40.0s
F03.08	Jog accel time	8.0s
F03.09	Jog decel time	8.0s
F04.00	Function of terminal DI1	1: Running forward (FWD) (FWD)
F04.01	Function of terminal DI2	4: JOG forward (FJOG)
F04.02	Function of terminal DI3	7: Fault reset
F04.03	Function of terminal DI4	5: JOG reverse (RJOG)
F04.04	Function of terminal DI5	39: External wire break fault
F05.00	Y1 output function	2: Fault output
H00.00	Type of wire drawing machine	0: Host

Note: Refer to group H00 for other parameters

5.2 Parameter setting reference of drive for water tank type wire drawing machine winding

Function code	Parameter Name	Recommended setting value
F01.08	Maximum frequency (Fmax)	75.00Hz
F01.09	Upper limit frequency (Fup)	75.00Hz
F02.00	Run command	1: Terminal control (LED on)
F02.02	Reverse-proof action	1: Reverse disabled
F02.12	Stop mode	0: Ramp to stop
F02.14	Stop DC braking current	10.0% (Base on real condition)
F02.16	Stop DC braking time	1.5 (Base on real condition)
F03.00	Accel time 1	2.0s
F03.01	Decel time 1	2.0s
F03.08	Jog accel time	2.0s
F03.09	Jog decel time	2.0s
F04.00	Function of terminal DI1	1: Running forward (FWD)
F04.01	Function of terminal DI2	4: JOG forward
F04.02	Function of terminal DI3	7: Fault reset (RESET)
F04.03	Function of terminal DI4	5: JOG reverse
F04.04	Function of terminal DI5	39: External wire break fault
F04.15	FWD/REV terminal control mode	2: Three-wire mode 1
F05.00	Y1 output function	3: Frequency-level detection FDT1 output
F05.10	FDT1 upper bound	1.00Hz
F05.11	FDT1 lower bound	2.00Hz

H00.00	Type of wire drawing machine	1: Winding
Note: Refer to group H00 for other parameters		

5.3 Parameter setting reference of drive for straight line wire drawing machine

Function code	Parameter Name	Recommended setting value
F01.08	Maximum frequency (Fmax)	75.00Hz
F01.09	Upper limit frequency (Fup)	75.00Hz
F02.00	Run command	1: Terminal control (LED on)
F02.02	Reverse-proof action	1: Reverse disabled
F02.12	Stop mode	0: Ramp to stop
F03.00	Accel time 1	20.0s
F03.01	Decel time 1	20.0s
F03.08	Jog accel time	20.0s
F03.09	Jog decel time	20.0s
F04.00	Function of terminal DI1	1: Running forward (FWD)
F04.01	Function of terminal DI2	4: JOG forward
F04.02	Function of terminal DI3	7: Fault reset (RESET)
F04.03	Function of terminal DI4	5: JOG reverse
F04.04	Function of terminal DI5	5: JOG reverse
H00.00	Type of wire drawing machine	3: straight line wire drawing machine
Note: Refer to group H00 for other parameters		

5.4 Parameter setting reference of drive for unwinding

Function code	Parameter Name	Recommended setting value
F01.08	Maximum frequency (Fmax)	75.00Hz
F01.09	Upper limit frequency (Fup)	75.00Hz
F02.00	Run command	1: Terminal control (LED on)
F02.02	Reverse-proof action	0: Reverse enabled
F02.12	Stop mode	0: Ramp to stop
F02.14	Stop DC braking current	10.0% (Base on real condition)
F02.16	Stop DC braking time	1.5 (Base on real condition)
F03.00	Accel time 1	2.0s
F03.01	Decel time 1	2.0s
F03.08	Jog accel time	2.0s
F03.09	Jog decel time	2.0s
F04.00	Function of terminal DI1	1: Running forward (FWD)
F04.01	Function of terminal DI2	4: JOG forward
F04.02	Function of terminal DI3	7: Fault reset (RESET)
F04.03	Function of terminal DI4	5: JOG reverse
F04.04	Function of terminal DI5	39: External wire break fault
H00.00	Type of wire drawing machine	2: Unwinding
Note: Refer to group H00 for other parameters		